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ABSTRACT

This initial phase of the comprehensive Missouri Physical Assessment Program consisted of the selection of test items to measure the components of perceptual-motor and motor performance for pre-school through grade six children. These components were identified as Balance, Rhythm and Coordination, Movement Patterns, Strength, and Perceptual-Motor-Match. Appropriate items were selected as measures of each component according to their content validity, suitability, ease of administration and scoring, and comprehensibility to the child. Items were designed to be administered by elementary school teachers. Reliability coefficients on the items are reported. Four profiles developed from the selected items allow for developmental levels in two-year, age-grade steps. The profiles are to be used as screening instruments, providing elementary classroom teachers with a relatively easy method for assessing perceptual-motor and motor performance, and not as diagnostic instruments. The test items, directions for administering and scoring, and scoring forms are included, together with recommendations for further research. (PR)

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FINAL REPORT

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BATTERIES DEVELOPED FOR PRE-SCHOOL THROUGH
GRADE SIX CHILDREN

Chappelle Arnett, Margaret M. Thompson
University of Missouri - Columbia
Columbia, Missouri 65201

February 1970

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INTRODUCTORY SECTION

Summary.

This investigation was a pilot study for the purpose of selecting test items to measure the components of perceptual-motor and motor performance for pre-school through grade six children. A profile of test items was developed for each of the following groups: Group A, pre-kindergarten and kindergarten; Group B, grades one and two; Group C, grades three and four; Group D, grades five and six. The test items were selected and designed primarily for use by elementary classroom teachers. This study was the initial phase of comprehensive study, the Missouri Physical Performance Assessment Program; further refinement of the test will be a part of a later study.

Following an analysis of the literature, the components of perceptual-motor and motor performance were identified as Balance, Rhythm and Coordination, Movement Patterns, Strength, and Perceptual-Motor-Match. Appropriate test items were selected as measures of each component according to content validity, suitability, ease of administration and scoring, and as being comprehensible to the child. The data were collected from 120 children, 30 in each group, living in the Columbia, Missouri area.

The statistical methods employed to assist in the selection of the items were correlational and analysis of variance techniques. In addition, the mean, standard deviation, median, semi-inter-quartile range, and range of scores of the items in each of the groups were calculated. Statistical techniques were also employed to establish reliability estimates for test items which required three trials, and to recommend the number of trials which would be required for these items.

The following criteria were established for the retention of items for each group:

- (1) examiners evidence of ease of administration and scoring efficiency;
- (2) consideration given for the involvement of each component of perceptual-motor and motor performance;
- (3) capable of differentiating abilities at all grade levels with the range of test scores large enough to produce a wide distribution of scores with most scores in the middle of the range;

- (4) consideration given for the size of the reliability estimate in relation to trend analysis for items which required three trials for performance;
- (5) items which measured similar abilities as evidenced by correlation coefficients of .70 and above were not to be duplicated in the final profile.

The final test items for each component of perceptual-motor and motor performance were as follows:

Balance: The following balance beam walking tests were recommended; walk forward, Group A; walk backwards, Groups A, C, and D; walk sideward with preferred foot leading, Groups C and D. The stork stand tests included balance on the right foot and balance on the left foot for Group A; balance on either foot was recommended for Group B.

Rhythm and Coordination: Various combinations of six alternating hopping tests were utilized within Groups A, B, C, and D. The forward roll test was recommended for Group B.

Movement Patterns: The following movement patterns were recommended for assessment with the checklists being utilized in rating performance: jumping and throwing patterns, Groups A, B, C, and D; catching and hopping patterns, Group A.

Strength: The following strength tests were recommended: Kraus-Weber tests which included the chest raise test and the leg raise test both performed in prone-lying position for Group B; the dynamometer press test, which included grip strength using the preferred hand was recommended for Groups C and D. There was no strength test recommended for Group A.

Perceptual-Motor-Match: The only test recommended as a measure of perceptual-motor-match was the chalk-board test for Groups A, B, and C.

Recommendations

Based on the findings, the recommendations may be listed as follows:

1. Modifications in some equipment utilized in this study should be examined. The use of a two-inch beam or a three-inch beam with grades one and two for the balance beam walking tests should be explored. The use of a balance stick of greater than one-inch width with a more stable base might improve the reliability of this test.

2. A checklist should be developed to assess pre-school children's performance on the balance beam walking tests. This would enable the examiner to note specific

information about the performance, such as one foot lead, and movement which is hesitating and tense.

3. Additional tests of balance, rhythm and coordination, and perceptual-motor-match should be explored for grades five and six.

4. Additional tests of strength should be examined for pre-school and grades one and two children.

5. Reliability estimates should be secured for the items in the profiles which required a test-retest situation in order to establish reliability.

6. Normative data should be collected for pre-school through grade six children and designated for grade levels.

7. A study of the relationship between the perceptual-motor and motor performance test items for the pre-kindergarten and kindergarten children and school readiness tests should be conducted. In addition, the relationship between the perceptual-motor and motor performance tests and academic achievement tests of school children should be studied.

Background for the Study.

Current theory and research by physical educators and psychologists suggest that much human learning begins with motor activity; body and mind are interrelated and not independent. Increasing interest in the perceptual-motor development in young children has led to recognition of the need for evaluation instruments which would enable educators to assess perceptual-motor and motor performance. This type of evaluation has been attempted in clinical situations more often than in public school settings.

Analysis of the literature reveals that the assessment of elementary school children has been based largely on measures of physical fitness and performance of specific sports skills which neglects the assessment of perceptual-motor and movement efficiency that is related to the total developmental level of the child. Information regarding perceptual-motor performance of children is extremely sparse. In relation to available tests, Smith reported that:

Many of the items in various test batteries, both for the assessment of perceptual functions and movement behavior, are extremely questionable concerning their validity, consistency and objectivity. (9)

The Purdue Perceptual-Motor Survey published by Roach and Kephart was designed primarily to detect errors in perceptual-motor development and is most commonly used

in this type of assessment (7). They have found that it effectively differentiates between achievers and non-achievers in school. The complete test contains items to measure balance, coordination, strength, laterality, directionality, body image, perceptual-motor-match, form perception and ocular control. Scoring scales used for the sub-test are not sufficiently discriminating in terms of use with the majority of average children in the public school situation. Further, the test is rather time consuming to administer and requires trained examiners to administer the test.

Godfrey and Thompson developed the Movement Pattern Checklists which are designed to evaluate major basic movement patterns (3). The checklists may be used to assess elements present in each movement pattern; thus they are useful in diagnosis and evaluation of motor performance in children. They are particularly valuable in that they are descriptive instruments and are concerned with the process, the movement rather than with the outcome or accuracy of the skill.

Numerous authors have agreed with the approach of Godfrey and Thompson in placing the emphasis on description of movement and observing the process of movement (2, 4, 6).

At Purdue University, Ismail, Kephart and Cowell in an extensive series of studies derived a number of motor aptitude tests and investigated use of these tests as predictors of academic achievement (5). The investigators suggested that on the basis of factor analysis, balance and coordination are important motor factors to be considered in tests. Other items utilized were designed to measure strength, power, and movement skills (4, 5).

Due to the nature of coordination and balance items it was postulated that these tasks required an intellectual analysis of each motor item and a formulation of a response which was transmitted neurologically to the appropriate muscle groups needed for correct execution of the motor item.

The Lincoln-Oseretsky Motor Development Scale was designed to test the motor ability of children between the ages of six and fourteen years (8). The test contains performance items which are both perceptual-motor and motor in nature. It is an individually administered scale consisting of 36 items involving a wide variety of motor skills such as finger dexterity, eye-hand coordination and gross activity of hands, arms, legs, and

trunk. Both unilateral and bilateral motor tasks are involved in the scale. The length of these tests as well as the training required to administer the tests make their usage prohibitive in the public schools.

This study was designed to: (1) analyze the existing literature in the selection of components and test items for the perceptual-motor and motor performance test profiles; (2) administer those items to four groups of children classified by grade level; and (3) select those test items, following appropriate analysis of the data, that appear to be the most acceptable for the perceptual-motor and motor performance profile.

The term perceptual-motor performance refers to balancing activities, eye-hand skills and object handling patterns. The term motor performance refers to gross motor performance in body handling and object handling skills.

Methods:

The components of perceptual-motor and motor performance were identified as balance, rhythm and coordination, movement patterns, strength and perceptual-motor-match. The appropriate test items for each component were selected according to content validity, suitability, ease of administration and scoring, and as being within a child's comprehension. The initial items selected pertaining to the components were as follows:

1. Balance. Tests of dynamic balance included the balance beam walking tests: (a) walk forward, (b) walk backwards, (c) walk sideways to the right, and (d) walk sideways to the left. Tests of static balance included (a) stork stand tests: balance on the right foot and balance on the left foot; (b) the balance stick tests: balance on the right foot and balance on the left foot.

2. Rhythm and Coordination. A series of six alternating hopping tests selected, were as follows: (a) hop right and left, (b) hop left and right, (c) hop two right and two left, (d) hop two left and two right, (e) hop two right and one left, and (f) hop two left and one right.

3. Movement Patterns. Movement patterns assessed included catching, hopping, jumping, and throwing. Movement patterns were assessed through utilization of the checklists with a score derived for each pattern.

4. Strength. Measures of strength included two items from the Kraus-Weber test and the dynamometer press test. The Kraus-Weber items were the chest and head raise and the leg raise both performed in a prone lying

position. The dynamometer press tests included grip strength of the right hand and grip strength of the left hand.

5. Perceptual-Motor-Match. The chalkboard test and the target throw test were selected as measures of perceptual-motor-match.

Items were utilized throughout all grades where appropriate; some items were modified consistent with expected performance of the particular age group. The tests were administered to 120 children living in the Columbia, Missouri area. These children represented a cross-section of the population of Columbia.

A test manual was developed as a guide for the personnel involved in the testing program. Examiners, junior and senior undergraduate students majoring in elementary education and graduate students in physical education, with minimum experience in working with young children were trained in administration of the items and assisted the investigator in the collection of data for each group. Age-level groups were identified as: Group A - pre-kindergarten and kindergarten; Group B - grades one and two; Group C - grades three and four; and Group D - grades five and six. Children in the pre-kindergarten group were tested individually. Those in the other groups were tested with each child involved in two testing sessions, a maximum of eight per session, using five or six testing stations. Eight examiners were required for each session and different examiners for each of the Groups A, B, C, and D were used. The investigator supervised all of the testing program; thus, uniformity in administration and test procedures were consistent throughout the sessions. The data were collected during a five week period in April and May, 1968.

Statistical Procedures

The statistical methods employed to assist in the selection of the items were correlational and analysis of variance techniques. In addition, the mean, standard deviation, median, and range of scores of the items for each group were calculated. Further statistical techniques included trend analysis on the test items which required three trials for the purpose of establishing reliability of the item and determining the appropriate criterion measure for the test item.

The following formula was used from the ANOVA analysis to derive a reliability coefficient which is known as the

intra-class correlation.

$$r = \frac{V_r - V_e}{V_r} = 1 - \frac{V_e}{V_r}$$

where V_r = variance for rows and V_e = variance for inter-action

The obtained reliability coefficient indicates the reliability of a sum or mean of the three trials. The reliability estimate is appropriate only if there is no trend in the trial means. The ANOVA employed must incorporate a trend analysis. Thus, if there is a significant linear or quadratic trend present denoting systematic trial to trial error variance, the following formula is utilized to establish reliability:

$$r = \frac{V_r - V_e}{V_r = (K-1) V_e} = \frac{F_1 - 1}{F_1 + k - 1} \quad \text{where}$$

$$F_1 = V_r / V_e \quad (1)$$

This formula is also used as an estimate of the degree to which the trials inter-correlate with each other.

Findings and Analysis

To determine the final items for each profile, three sequential steps were followed.

The first step included the retention of items based upon the following criteria:

1. Examiners evidence of ease of administration and scoring of test items.
2. Consideration given for the involvement of each component of perceptual-motor and motor performance.
3. Capable of differentiating abilities at all grade levels with the range of test scores for each group level large enough to produce a spread of scores with most scores within the middle of the range and few extreme scores. If 75 percent of the scores were within one to three points of the maximum score or the minimum score, the item was eliminated.
4. Consideration of the size of the correlation coefficients between test items designated as measures of a component of perceptual-motor and motor performance. If the coefficient was above .70, then the relationship was judged to be high. One item was eliminated.

The second step was to determine reliability estimates for the item which utilized three trials for performance. Reliability estimates were derived from a two-way ANOVA

and trend analysis; the number of trials was recommended for items which initially required three trials.

The final step was the analysis of the remaining items for the size of the coefficients between the items of all the components. There was to be low to moderate relationship (.10 to .50) between items selected as measures of the components of perceptual-motor and motor performance, therefore avoiding duplication.

The data were processed on an IBM computer; procedures and programming were conducted with the assistance of the University Computer Center.

Presented in Table I are the mean, standard deviation, median, and range of scores of all the items utilized within each group. With the same items used from group to group, there is a gain in the mean score with each group on most of the test items. The balance beam tests were too easy for Group B; therefore, spurious scores resulted. The slight difference in mean scores between Group B, C, and D indicated there was no gain in performance by virtue of grade level.

The target throw test, originally considered for Group D, was eliminated as the test proved to be too difficult for this group.

Reliability estimates were determined for the test items which required three trials for performance of the test. The following items were included: balance beam walking, stork stand, stick balance, alternating hopping tests, forward roll, standing broad jump, and dynamometer press. Two reliability estimates were computed on the tests. These estimates were designated as estimates (1) and (2). (1) was appropriate for those items which did not reveal a significant trend in trials was present. This estimate also indicated the correlation between the three trials. Reliability estimate (2) was used when a significant trend in trials was present. This estimate also indicated the correlation between the three trials. If reliability estimate (2) is sufficiently high (.85 and above), this permits the use of only one or two trials for the total test. Reliability estimate (1) should be considered only when three trials and no less are to be utilized and there is no significant trend present in the trials.

TABLE I

GROUP A, B, C, D, - MEANS, S. D., MEDIAN, RANGE

	A			B			C			D		
	M	S.D.	Med	R	M	S.D.	Med	R	M	S.D.	Med	R
Beam, Walk For.	16.3	4.92	19	16	29.53	.957	30.0	3				
Beam, Walk Back.	14.03	5.26	16	20	27.83	2.49	29	11	22.9	5.11	23	22
Beam, Walk Side R	16.4	5.46	19	20	28.53	1.96	29	8.0	19.9	6.16	20	24
Beam, Walk Side L	11.5	5.44	19	20	28.63	1.87	29	9.0	20.67	5.42	20	21
Stork Stand, Rt.	19.03	12.79	17	63	43.35	23.23	44.5	82.0				
Stork Stand, Left	13.63	9.30	12	34	40.63	25.98	32.2	85.4				
Stick Bal., Rt.									29.94	19.26	27.2	96.9
Stick Bal., Left									28.68	19.64	24.4	78.1
Hop, Rt. & Left	3.2	2.89	2.0	9.0	6.20	2.85	6.0	9.0	7.47	2.20	9.0	7.0

	A			B			C			D		
	M	S.D.	Med	R	M	S.D.	Med	R	M	S.D.	Med	R
Hop, Left & Rt.	3.13	3.01	3.0	9.0	6.50	2.55	8.0	9.0	7.4	2.22	9.0	9.0
Hop, 2 Rt. & 2 Left	3.2	3.18	2.0	9.0	5.43	2.26	5.0	9.0	7.60	2.08	9.0	7.0
Hop, 2 Left & 2 Rt.	2.93	30.48	0	9.0	5.8	2.54	6.0	9.0	7.63	2.11	9.0	7.0
Hop, 2 Rt. & 1 Left					4.03	2.80	3.0	9.0	7.23	2.36	8.0	9.0
Hop, 2 Left & 1 Rt.					4.57	3.14	3.0	9.0	7.10	2.31	7.0	8.0
Forward Roll					9.83	3.09	10	14	11.23	2.16	11.0	9
Hopping	35.7	8.45	38	45								
Br Jump, Mean	31.4	8.77	31	52	47.43	6.78	47	24.0	50.53	7.22	49	29
Jumping, Checkl	37.5	9.59	37	50	42.27	5.53	45	21	46.2	4.90	45	16
Throwing, Checkl	33.03	10.61	30	36	42.03	8.56	40	29	36.87	8.84	38	30

TABLE I (continued)

	A			B			C			D		
	M	S.D.	Med	R	M	S.D.	Med	R	M	S.D.	Med	R
Catching, Checkl	38.13	9.97	36	43								
K-W (a)					9.1	1.76	10	5.0	9.09	3.11	10.0	10
K-W (b)					7.63	2.71	9.0	7.0	9.03	2.78	8	8
K-W Total					16.73	3.96	18	12	18.1	3.66	18	14
Dyna. Press, Rt.									108.37	27.74	114	102
Dyna. Press, Left									96.73	29.76	99	119
Chalkboard	13.2	2.86	14	14	15.6	2.09	16	8.0	15.4	2.88	16	14

Presented in Table II are the reliability estimates for balance, rhythm and coordination tests, movement patterns and strength test. Due to the low reliability estimates obtained for the stick balance test, these tests of static balance were eliminated from further consideration. Due to the low reliability estimates of the forward roll in Group C, this item was eliminated for that particular group. The reliability estimates for the broad jump items in Group A, B, and C were high; however, there is a significant trend occurring in Groups A and B. Therefore, since an assessment of jumping was included on the movement pattern checklists and there seems to be no alternative in terms of reducing the trend effect occurring between trials in these Groups, it was decided that the standing broad jump should be studied further and would be dropped as an item.

The final step was the analysis of the remaining items for the size of the coefficients between the items of all the components. Within each Group A, B, C, and D final correlation coefficients were analyzed to avoid unnecessary duplication. The relationship between the remaining items was generally from $-.10$ to $.20$. (The number of coefficients calculated prohibits their publication here, however, they may be obtained from the author.)

The final test items for each component of perceptual-motor and motor performance were as follows:-

Balance. The following balance tests were recommended to measure dynamic balance: for Group A, walk forward and walk backward using a four-inch balance beam; for Group C and D, walk backward, walk sideward with the preferred foot leading utilizing a two-inch balance beam. A practice trial should precede the three trials for these tests. The stork stand test was recommended as a measure of static balance. For Group A, balance on the right foot and balance on the left foot; for Group B, balance on the preferred foot.

Rhythm and Coordination. Various combinations of the six alternating hopping tests were utilized with Groups A, B, C, and D. A practice trial is recommended to precede two trials for each test. The tests included for Group A were as follows: hop right and left, hop left and right, hop two right and two left, and hop two left and two right. The tests included for Groups B and C were: hop left and right, hop two right and two left, and hop two left and one right. For Group D, tests were: hop two right and one left and hop two left and one right. The forward roll test was recommended for Group B.

TABLE II
RELIABILITY COEFFICIENTS

ITEMS	Trial F values ¹	Trend F values ²	Rel. Est.1	Rel. Est.2	S.D.	ϵ Meas.
<u>Group D</u>						
Beam, walk back.	7.15*	13.50*		.64	4.47	.983
Beam, walk side R	6.87*	12.85*		.68	5.49	1.19
Beam, walk side L	1.66	3.33	.78		4.97	1.36
<u>Group B</u>						
Stork St. R	1.23	2.20	.709	.447	24.47	7.35
Stork St. L	.155	.045	.829	.617	25.78	6.24
<u>Group C</u>						
Stick Bal., R	1.80	.376	.446	.211	19.26	8.36
Stick Bal., L	1.13	.035	.118	.042	19.64	10.60

¹df 2 and 58 *.05=3.14; .01=4.98

²df 1 and 58 *.05=4.00; .01=7.08

TABLE II (continued)
RELIABILITY COEFFICIENTS

ITEMS	Trials F values	Trend F	Rel. Est. (1)	Rel. Est. (2)	S.D.	Meas.
Alternating Hopping Group B						
Hop, rt. & left	3.22*	5.43*		.814	2.85	.443
Hop, left & rt.	3.40*	2.92		.909	2.55	.453
Hop, 2 rt. & 2 left	1.62	3.24	.935	.828	2.26	.430
Hop, 2 left & 2 rt.	.85	1.71	.930	.815	2.54	.392
Hop, 2 rt. & 1 left	.040	.060	.898	.745	2.80	.525
Hop, 2 left & 1 rt.	3.11	6.19*	.936	.829	3.14	.466
Forward Roll Group B	7.52*	13.193*		.728	3.09	.604
Group C	3.85*	7.628*		.577	2.16	.560

¹df 2 and 58 *.05=3.15; .01=4.98

²df 1 and 58 *.05=4.00; .01=7.08

TABLE II (continued)
RELIABILITY COEFFICIENTS

ITEMS	Trials F values ¹	Trend F ₂	Rel. Est. (1)	Rel. Est. (2)	S.D.	Meas.
BROAD JUMP						
Group A	4.56*	9.12*		.906	9.25	3.42
Group B	3.62*	6.26*		.843	7.35	2.94
Group C	.287	.196	.897		7.98	4.11
DYNAMOMETER PRESS						
Group C						
Grip St. r	17.62*	30.79*		.897	27.74	3.14
Grip St. l	10.85*	17.20*		.904	29.76	3.27
Group D						
Grip St. r	6.80*	13.42*		.903	33.05	3.63
Grip St. l	13.03*	20.24*		.936	36.19	3.18

¹df 2 and 58 *.05=3.15; .01=4.98

²df 1 and 58 *.05=4.00; .01=7.08

Movement Patterns. The following movement patterns were recommended for assessment with the checklist being utilized to rate performance: for Group A, hopping, jumping, throwing, and catching; for Groups B, C, and D, jumping and throwing. Jumping and throwing should be rated on the pattern checklists while the subject performs the standing broad jump or the target throw. The distance and accuracy of these two tests are not to be recorded.

Strength. No strength test was recommended for Group A. For Group B, the Kraus-Weber Tests (included the chest and head raise and the leg raise performed in prone-lying position) were recommended. For Groups C and D, the dynamometer press test using the preferred hand was selected. One trial was deemed sufficient for the test since reliability estimates were high.

Perceptual-Motor-Match. The only test recommended for measurement of perceptual-motor-match was the chalkboard test for Groups A, B, and C. The target throw test was originally considered for Group D, but the test proved too difficult for this group.

SUMMARY

On the basis of the criteria established, test items were selected to yield four profiles of perceptual-motor and motor performance. The four profiles developed from the test items utilized allow for developmental levels in two-year, age-grade steps: pre-kindergarten and kindergarten, grades one and two, grades three and four, grades five and six. None of the test items for the strength component for Group A children or perceptual-motor-match component for Group D children met the criteria for acceptance.

The items contained within the profile were not designed to pass or fail a child in perceptual-motor and motor performance. Due to varying developmental and maturational differences, children who achieve low scores on the test items should not be considered as failing the test. The profiles should be utilized as screening instruments which provide elementary classroom teachers with a relatively easy method for assessing perceptual-motor and motor performance.

The profiles should not be considered as diagnostic instruments for the assessment of perceptual-motor and motor performance. Some children may require additional testing and diagnosis. Children whose performance is poor should be referred to appropriate specialists for additional testing.

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APPENDIX
TEST MANUAL
SCORING FORMS

MANUAL FOR EXAMINERS

General Instructions

The test items are intended to assess perceptual-motor and motor performance and not the ability to comprehend instructions, motivation, etc. Every effort should be made to get the best performance out of the child so that the level of performance observed and recorded reflects as accurately as possible the true ability of the child. The examiner should demonstrate what is required of the child. Demonstration minimizes difficulty in understanding verbal instructions. Where comprehension difficulty is suspected as a cause of failure, the examiner should note this on the score sheet. The examiner should be specific in comments regarding deviations in performance, inability to perform, etc.

The children are not required to change clothes for the test but will be requested to wear a minimum of clothes in order to make observation of movement easier. Rubber-soled shoes are preferable.

The components of perceptual-motor and motor performance with test items are included in the following sections.

COMPONENTS OF PERCEPTUAL-MOTOR AND MOTOR PERFORMANCE
WITH APPROPRIATE TEST ITEMS

BALANCE: DYNAMIC AND STATIC

¹
Balance Beam Tests:

1. Forward Walk: Pre-kindergarten and kindergarten
Equipment: Section of two-by-four board measuring eight feet long and placed on brackets so that the board is at least four inches off the floor. The four inch side of the two-by-four is the surface on which the child is asked to walk in pre-kindergarten and kindergarten.
Description: The subject assumes a starting position with the preferred foot on the beam and the other foot on the floor at the starting point. At the signal "ready-go," the subject walks ten steps forward on the beam in a heel-toe fashion.

¹Taken from A. H. Ismail and J. J. Gruber, Motor Aptitude and Intellectual Performance (Columbus: Charles E. Merrill Books, Inc., 1967), p. 47.

Rules:

- (1) No practice trial is allowed.
- (2) Two trials are allowed for the test.
- (3) Stepping crosswise or stepping down from the beam each constitutes an error.
- (4) The examiner stops the subject whenever he commits an error. The subject will be instructed to start walking again from the point of error. This process is continued until the subject has walked ten steps on the beam.
- (5) Any step on which the subject commits an error is not considered as a step.

Scoring:

- (1) Ten points are allowed for each trial, thus a total score of twenty (20) is possible for the pre-kindergarten and kindergarten children.
- (2) For each trial the score is constituted by ten (10) minus the number of errors.
- (3) For each trial no minus score is allowed (i.e., zero is given on the

trial where ten or more errors are committed).

- (4) The summation of the scores on the trials constitutes the subject's total score on the test.
- (5) Scoring for pre-kindergarten is modified as some children are unable to walk heel-toe on the beam;
 - (a) two points are given if the child moves with one foot leading;
 - (b) six points are awarded if the child can walk on the beam but does not walk in heel-toe fashion;
 - (c) if the child is able to walk heel-toe, the scoring scheme shown above is utilized.

2. Walk Backwards: Pre-kindergarten and kindergarten utilize four inch balance beam, otherwise Equipment, Description, Rules and Scoring are the same as in Test No. 1.

Grades three through six use a two inch balance beam. A practice trial should be allowed preceding three (3) trials, otherwise, Equipment, Description, Rules, and Scoring are the same as in Test No. 1.

3. Sidewise Walking: Grades three through six walk with preferred foot leading.

Equipment: Same as in Test No. 1 except the two inch side of the two-by-four is the surface on which the child is asked to walk for grades three through six.

Description: The subject assumes a starting position with the preferred foot on the beam, making a right angle with the beam. At the signal "ready-go" the subject walks ten steps sidewise on the ball of the foot on the beam by moving his preferred foot to the right and bringing his other foot up to it.

Rules and Scoring: Same as in Test No. 1.

Stork Stand Tests:²

4. Standing on Right Foot and Left Foot on the Floor: Pre-kindergarten and kindergarten. Stand on preferred foot for grades one and two.

Equipment: Stopwatch

Description: The subject assumes a position of standing motionless on the right foot while the sole of the left foot is

²Taken from A. H. Ismail and J. J. Gruber, Motor Aptitude and Intellectual Performance (Columbus: Charles E. Merrill Books, Inc., 1967), p. 43.

placed against the inside of the supporting knee. The palms of the hands rest on the outside of the thighs. The subject holds this position for 30 seconds maximum.

Rules:

- (1) No practice trial is allowed.
- (2) Two trials are used in pre-kindergarten and kindergarten groups, three trials for grades one and two.
- (3) Moving one hand or hands from the side, losing balance, or touching the floor with one foot or moving the right foot from its original position is an error.

Scoring:

- (1) Thirty seconds are allowed for each trial, thus a total score of ninety seconds is possible; or sixty seconds in pre-kindergarten and kindergarten.
- (2) The score for each trial is the number of seconds (nearest tenth) the subject is able to hold his balance. Pre-kindergarten and kindergarten should be recorded to nearest second.

(3) The summation of the number of seconds in the total trials constitutes the subject's total score for the test.

RHYTHM AND COORDINATION

5. Hopping: Right and Left³ Pre-kindergarten
and kindergarten

Equipment: None

Description: The subject stands on his right foot with his left foot off the floor and his hands on his hips. At the signal "ready-go," the subject hops in place on the right and then hops on the left foot in an alternative way three times.

Rules:

- (1) One practice trial is allowed for the test.
- (2) Two trials are allowed for the test.
- (3) Removing the hand or hands from the hips, faulty foot work, or jerky and unrhythmical action each constitutes an error.

Scoring:

- (1) Three points are allowed for each trial thus a total score of six
- (6) points is possible.

³Taken from A. H. Ismail and J. J. Gruber, Motor Aptitude and Intellectual Performance (Columbus: Charles E. Merrill Books, Inc., 1967), p. 41.

- (2) For each trial the score is computed by subtracting the number of errors from a score of 3. No minus score is allowed.
- (3) The summation of the scores on the two trials constitutes the subject's total score.

6. Hopping: Left and Right: Pre-kindergarten

through grade four

Equipment, Description, Rules and Scoring are identical to those of Test No. 5 except that the subject executes the test starting with the left foot instead of the right foot.

7. Hopping: Two Right and Two Left: Pre-kindergarten

through grade four

Description: The subject stands on his right foot with his left foot off the floor and his hands on the hips. At the signal "ready-go" the subject hops twice on the right foot and then twice on the left foot in an alternative way three times.

Rules and Scoring: Same as in Test No. 5

3. Hopping: Two Left and Two Right: Pre-kindergarten
and kindergarten

Description, Rules and Scoring as in
Test No. 7 except that the subject
executes the test starting with the
left foot instead of the right foot.

9. Hopping: Two Right and One Left: Grades five
and six

Description: The subject stands on his right foot
with his left foot off the floor and
his hands on his hips. At the signal
"ready-go," the subject hops in place
twice on the right foot and once on
the left. He repeats this pattern
three times.

Rules and Scoring are identical to those in Test
No. 7.

10. Hopping: Two Left and One Right: Grade one through
grade six

Description, Rules and Scoring are
identical to those of Test No. 9
except the subject executes the test
starting with the left foot instead
of the right.

11. Forward Roll:⁴

Grades one and two

Equipment: Tumbling mat

Description: The subject is instructed to perform a somersault or forward roll and continue to do two rolls on the mat and stand up after two rolls.

Rules:

- (1) No practice trial is allowed.
- (2) Three trials are allowed for the test.
- (3) The rolls are graded on a 0 to 5 point scale for each trial. One point is given for each part performed correctly.
 - a. rolls in a straight line
 - b. head tucked under
 - c. back rounded
 - d. head does not touch mat
 - e. comes to a standing position.

Scoring:

- (1) Five points are allowed for each trial thus a total score of 15 points is possible.
- (2) The summation of the scores on the

⁴Taken from Lindle Jarvis, "Effects of Self-Instructive Materials in Learning Selected Motor Skills," Research Quarterly, 38:4, December, 1967.

three trials constitutes the
subject's total score.

MOVEMENT PATTERNS

Movement Pattern Checklists plus two tests, standing broad jump and target throw, are used to assess hopping, jumping, throwing and catching patterns.⁵ The checklists contain spaces for comments and remarks by the examiner. The procedures for administering the checklists consist of asking the subjects to perform the desired movement pattern; specific instructions are given below. The examiner then checks the blanks in front of all applicable items under both "Pattern Elements Present" and "Deviations Noted." If an item is especially pronounced, a plus (+) is placed after the check; if it is slight a minus (-) is placed after the checks.

Beyond the placing of checkmarks, scoring can be carried out in a variety of ways. The scoring system devised by Sharpe⁶ is as follows:

Check - minus (✓-)	One point
Check (✓)	three points

⁵Taken from Barbara B. Godfrey and Margaret M. Thompson, Movement Pattern Checklists (Columbia, Missouri: Kelly Press Inc., 1966), 25 pp.

⁶Gary D. Sharpe, "Effectiveness of Specified Physical Education Programs and Establishment of Selected Motor Performance Norms for the Trainable Mentally Retarded" (unpublished Ph.D. dissertation, January, 1968), pp. 68-9.

Check - plus (✓+) five points

The score for each subject is then derived from four sequential steps: First, the cumulative total of points for "Pattern Elements Present" is obtained. Second, the cumulative total for "Deviations Noted" is figured. Next, the difference between the "Pattern Elements Present" and the "Deviations Noted" is computed. And, finally, a numerical constant of thirty is added to the value arrived at in the preceding step to eliminate working with negative scores. Prior to the addition of this constant, computed scores had ranged from a negative thirty (-30) to a positive (30). With the addition of this constant the scale range adjusted to zero (0) through sixty (60) with thirty (30) becoming the neutral score; that is, the points at which the number of "Pattern Elements Present" and "Deviations Noted" were equal. A score of thirty-three would indicate that an individual had demonstrated one more pattern element than deviation. The following movement patterns are assessed.

Hopping: Checklist Rating⁹ Pre-kindergarten - kindergarten

Equipment: Eraser or bean bag.

Description: The child is asked to hop on the right foot (or point to the right foot) to

⁹Taken from Barbara B. Godfrey and Margaret M. Thompson, Movement Pattern Checklists (Columbia, Missouri: Kelly Press, Inc., 1966), p. 17.

pick up the object which is placed five yards away and then to return on the same foot. Repeat the test on the left foot.

Scoring: Check marks placed in appropriate blanks as explained in introductory section.

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
____ Takes off and lands same foot	____ Loses balance, ____ back, ____ fwd, ____ L, ____ R
____ Bends ankles, hips	____ Arches back
____ Can do hop either foot	____ Twists or bends, ____ L, ____ R on ____ L foot, ____ R ft., ____ fwd hop
____ Hop in straight line	____ Hop one foot only, ____ L, ____ R
____ Uses arms	____ Jarring, heavy landing
Comments:	____ Uses other foot to assist
	____ Toes in, ____ toes out

Jumping

Pre-kindergarten - grade six

Standing Broad Jump¹⁰

Equipment: Mat with measures from two feet to eight feet marked on the mat in one-inch marks.

¹⁰Taken from A. H. Ismail and J. J. Gruber, Motor Aptitude and Intellectual Performance (Columbus: Charles E. Merrill Books, Inc., 1967).

Description: The subject stands behind the take-off line on the mat. With a double foot take-off (jumping with both feet) the subject jumps forward as far as possible and lands on both feet. At any time before the take-off, the subject is free to swing his arms and bend his knees as he wishes. Once the subject crosses the take-off line, a jump is counted.

Rules:

- (1) Three trials are allowed and each is recorded to the last inch.
- (2) The distance jumped is the distance in a vertical line between the take-off and the nearest point the subject touches after landing.

Scoring: Performance is rated on the jumping checklist. For purposes of motivation, not for a profile measure, the following is to be used.

- (1) The total number of inches is recorded for each jump.
- (2) The summation of the total number of inches for the three jumps is recorded.
- (3) The mean score of the three trials will be considered as the score for the item.

Jumping: Checklist¹¹

Directions: While subject is performing the standing broad jump, rate his pattern performance as indicated on the checklist.

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
<u>Arms swing back as legs bend</u>	<u>No arm swing, ___back only, ___up only</u>
<u>Arms swing up as legs extend</u>	<u>Jumps to side, ___L, ___R</u>
<u>Uses two-foot take off</u>	<u>Stumbles or falls on landing</u>
<u>Straight direction</u>	<u>Doesn't use arms to help</u>
<u>Brings arms down on landing</u>	<u>Uses one arm only, ___L, ___R</u>
Comments:	<u>Twists or bends to side, ___L, ___R</u>

¹¹Taken from Barbara B. Godfrey and Margaret M. Thompson, Movement Pattern Checklists (Columbia, Missouri: Kelly Press Inc., 1966), p. 17.

Catching: Checklist¹²

Pre-kindergarten - kindergarten

Equipment: 8½" Playground ball.

Description: Instruct the subject to stand 6 feet from the examiner and catch the ball when it is thrown to him. The examiner will throw the ball easily to the subject in five different ways: (1) throw directly to the child, (2) throw to his right, (3) throw to his left, (4) throw the ball so that he reaches overhead to catch it and (5) bounce it to him.

Scoring: Record pattern performance as indicated on checklist.

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
___ Catches with both hands	___ Catch against body only
___ Catches with L __, R __ hand	___ Can't catch either side; ___ L, ___ R only
___ Retains control of object	___ Stiff, rigid fingers, ___ arms
___ Gives to lessen impact	___ "Loses" object before catching
___ Points fingers up, down out	___ Grasps too soon, ___ too late

¹²Taken from Barbara B. Godfrey and Margaret M. Thompson, Movement Pattern Checklists (Columbia, Missouri: Kelly Press Inc., 1966), p. 21.

____ Ease and control of movement

____ "Braces" body direction throw

____ Body in position in time for catch

Comments:

____ Loses balance, ____ almost

____ Can't catch overhead, ____ underhand

____ Abortive movement in free arm

____ Can't follow flight of ball with eyes

Throwing

1. Overhand throw

Pre-kindergarten through grade four

Equipment:

A plastic ball (size of a tennis ball) was used. A line is drawn on the floor parallel to the wall surface: (a) ten feet from wall for pre-kindergarten through second grade; (b) fifteen feet from wall for grades three and four.

Description:

The subject takes the ball in the preferred hand and is instructed to stand behind the restraining line and with an overhand motion (demonstrate) throw the ball to the wall as hard as possible. Pre-kindergarten through grade two children are requested to throw with each hand; in grades three and four the children are requested to throw with only the preferred hand.

Rules:

- (1) No practice trials are allowed.
- (2) Three trials should be sufficient to rate the performance.
- (3) Rate the pattern performance on the checklist.

2. Target Throw⁷

Grade five and grade six

Equipment:

Four regulation softballs (12 inch), masking tape, a container for balls at the throwing line, and a target. On a wall surface, draw a clearly visible circle with the center four feet from the floor surface and with an outside diameter of two feet. Directly in front of the target, mark a visible throwing line thirty feet from the center of the target.

Description:

Standing behind the throwing line and using an overhand throw with the softball, the subject attempts to hit the target as many times as he can in ten throws. No step over the line is allowed on the throw and the balls hitting the line are good.

⁷University of the State of New York, The New York Physical Fitness Test (State Education Department, Division of Health, Physical Education, and Recreation, 1958), p. 23.

Scoring:

Utilize the throwing checklist, however, one point on the scoresheet may be recorded for each throw which hits the target as a motivational device.

3. Throwing Checklist⁸

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
<u>Swinging, pushing throws</u>	<u>No swing L, R; no push L, R</u>
<u>Opposition arm and leg with swing</u>	<u>Uses only left side, right side</u>
<u>Cross extension with push</u>	<u>Throws with both arms only</u>
<u>Able throw with L arm, R arm</u>	<u>Loses balance, almost</u>
<u>Uses whole body for distance</u>	<u>Jerky or uncontrolled movement</u>
<u>Controls object while throwing</u>	<u>Same side arm, leg forward</u>
<u>Similarity pattern each side</u>	<u>Gives force only with arms, body</u>
Preferred hand L R, No.	

⁸Taken from Barbara B. Godfrey and Margaret M. Thompson, Movement Pattern Checklists (Columbia, Missouri: Kelly Press Inc., 1966), p. 21.

STRENGTH

1. Kraus-Weber Tests¹³ Grades one and two

chest and Head Raise

Equipment: Mat and small pillow

Description: Instruct the subject to lie face down on the mat provided. Place a small pillow under the subject's hips. Tell him to place his hands on the back of his neck and clasp his hands together. Now hold the subject's feet and ask him to raise his head, shoulders, and chest off the floor while counting to ten. The subject should be able to hold this position for at least ten seconds. By preceding the count by saying "a thousand" (a thousand one, a thousand two, etc.) one can accurately measure a ten second time period. Score one point for each second the exercise is held. Scoring was devised by the investigator.

¹³Taken from Hans Kraus and Ruth Herschland, "Minimum Muscular Fitness Tests for School Children," Research Quarterly, 58:412-19, October, 1957.

Leg Raise: second test

Equipment: Mat and small pillow

Description: Test is similar to the first test except that the subject lies face down with his head resting on his hands. The pillow remains under the hips. The child is now asked to raise his legs about 10 inches off the floor without bending his knees. Hold the child's chest down by placing your hand between his shoulder blades. He should hold this position for ten seconds.

Scoring: Ten points are allowed for each test, thus a total score of twenty is possible. Score one point for each second the exercise is held. The summation of the scores on the two tests constitutes the subject's total score on the test.

2. Dynamometer Press: Grip Strength¹⁴ Grade three -
grade six

Equipment: Narrangansett hand dynamometer.

¹⁴Taken from A. H. Ismail and J. J. Gruber, Motor Aptitude and Intellectual Performance (Columbus: Charles E. Merrill Books, Inc., 1967), pp. 39-40.

Description: The examiner places the dynamometer properly in the preferred hand of the subject. The dynamometer should be placed so that the dial of the dynamometer faces the palm of the hand. The subject squeezes the dynamometer as tightly as he can.

Rules:

- (1) No practice trial is required, but subject should understand the operation of the dynamometer.
- (2) One trial is allowed
- (3) The score for the trial is recorded.

Scoring: The score for the trial is recorded.

PERCEPTUAL-MOTOR-MATCH

1. Chalkboard Test:¹⁵ Double circles Pre-kinder-
garten - grade four

Equipment: Chalkboard, chalk, eraser.

Description: The child should draw one circle first and the examiner notes which hand is the dominant hand. Ask the child to take a piece of chalk in each hand and draw two circles at the same time. The circles should be large (20 - 24 inches in diameter). If subject draws small circles, examiner may place the subject's hands 20 to 24 inches apart if the subject does not understand directions.

Scoring: The following are errors for which two points should be subtracted:

- (1) First attempts are small and far apart.
- (2) Circles do not reach proper size.

¹⁵Taken from Eugene Roach and N. C. Kephart, The Purdue Perceptual-Motor Survey (Columbus: Charles E. Merrill Books, Inc., 1966), pp. 48-51.

- (3) One circle larger than the other.
- (4) One more accurate than the other.
- (5) Circles drawn on top of the other.
- (6) Directions incorrect: hands parallel.
- (7) Directions incorrect: opposite but wrong direction. Right handed child: direction of the drawings should be right hand counter-clockwise, left hand clockwise. For the left handed child, these directions are reversed. The dominant hand should go counter-clockwise.
- (8) Circles flat toward inside.
- (9) Inaccuracies which are not parallel in both circles.
- (10) Visual attention directed to one hand.
- (11) Movement of the two arms not synchronized.

Twenty (20) points are allowed for performance on this test. The score is 20 minus 2 points for each error. The scoring scheme was devised by the investigator.

SCORING FORMS FOR PERCEPTUAL-MOTOR
AND MOTOR PERFORMANCE TESTS

Group A: Pre-K and K

Name: _____ Grade _____ School _____

Sex: _____ Date: _____

BALANCE: DYNAMIC and STATIC

BALANCE BEAM TESTS: Trials

Walk Forward (1) _____ (2) _____ Total: _____

Walk Backwards (1) _____ (2) _____ Total: _____

Scoring: for each trial subtract number of errors from 10.

STANDING ON RIGHT FOOT (1) _____ (2) _____ Total: _____
(30 sec. max.)

STANDING ON LEFT FOOT (1) _____ (2) _____ Total: _____

Scoring: for each trial record time to the nearest second.

RHYTHM and COORDINATION

HOPPING: Right and Left: (1) _____ (2) _____ Total: _____
Left and Right: (1) _____ (2) _____ Total: _____

HOPPING: 2 Right and 2 Left: (1) _____ (2) _____ Total: _____
2 Left and 2 Right: (1) _____ (2) _____ Total: _____

Scoring: for each trial subtract number of errors from 3.

MOVEMENT PATTERNS:

HOPPING: Hop on Right Foot, 5 yards: Return: Hop on
Left Foot, 5 yards, Return.

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
____ Takes off and lands same foot	____ Loses balance, _____ back, _____ fwd, _____ L, _____ R
____ Bends ankles, hips	____ Arches back

___ Can do hop either foot

___ Twists or bends, ___L,
___R on ___L foot,
___R ft. ___, fwd hop, ___

___ Hop in straight line

___ Hop one ft. only, ___L,
___R

___ Uses arms

___ Jarring, heavy landing

Comments:

___ Uses other foot to
assist

___ Toes in, ___toes out

Scoring: Place a check (✓) in the blank for every applicable item; if the item is especially pronounced a plus (+) should be placed after the check; an ordinary deviation or pattern element would have a check (✓); a very good element or a very bad deviation a check plus (✓+) and a weak element or barely present deviation a check minus (✓-).

JUMPING: (Standing Broad Jump)

Pattern Elements Present	Deviations Noted
___ Arms swing back as legs bend	___ No arm swing, ___back only, ___up only
___ Arms swing up as legs extend	___ Jumps to side, ___L, ___R
___ Uses two-foot take off	___ Stumbles or falls on landing
___ Straight direction	___ Doesn't use arms to help
___ Brings arms down on landing	___ Uses one arm only, ___L, ___R
Comments:	___ Twists or bends to side, ___L, ___R

Scoring: see Movement Pattern Scoring.

CATCHING:

Pattern Elements Present	Deviations Noted
___ Catches with both hands	___ Catch against body only
___ Catches with L ___, R ___ hand	___ Can't catch either side; ___ L, ___ R only
___ Retains control of object	___ Stiff, rigid fingers, ___ arms
___ Gives to lessen impact	___ "Loses" object before catching
___ Points fingers up, down, out	___ Grasps too soon, ___ too late
___ Ease and control of movement	___ Loses balance, ___ almost
___ "Braces" body direction throw	___ Can't catch overhead, ___ underhand
___ Body in position in time for catch	___ Abortive movement in free arm
	___ Can't follow flight of ball with eyes

Scoring: see Movement Pattern Scoring.

OVERHAND THROWING:

Pattern Elements Present	Deviations Noted
___ Swinging, ___ Pushing throws	___ No swing L, ___ R; no push ___ L, ___ R
___ Opposition arm and leg with swing	___ Uses only left side, ___ Right side
___ Cross extension with push	___ Throws with both arms only
___ Able throw with L arm, ___ R arm	___ Loses balance, ___ almost

___ Uses whole body for distance

___ Jerky or uncontrolled movement

___ Controls object while throwing

___ Same side arm, leg forward

___ Similarity pattern each side

___ Gives force only with arms, ___ body

Preferred hand ___ L, ___ R, ___ NO.

Scoring: see Movement Pattern Scoring.

PERCEPTUAL-MOTOR MATCH: Chalkboard, double circles;
total 20 pts; minus 2 pts for each error

Errors:

___ first attempts are small and far apart

___ directions incorrect; opposite but wrong direction

___ circles do not reach proper size

___ circles flat toward inside

___ one circle larger than the other

___ inaccuracies which are not parallel in both circles

___ circles drawn on top of the other

___ visual attention directed to one hand

___ directions incorrect; hands parallel

___ movement of two arms not synchronized

SCORING FORMS FOR
PERCEPTUAL-MOTOR AND MOTOR PERFORMANCE TESTS

Group B: Grades 1 and 2

Name: _____ Grade _____ School _____

Sex: _____ Date: _____

BALANCE:

Trials

STANDING ON PREFERRED FOOT (1)____ (2)____ (3)____ Total:____

Scoring: for each trial record time to the nearest tenth of a second.

RHYTHM and COORDINATION:

HOPPING: Left and Right (1)____ (2)____ Total:____

HOPPING: 2 Right and 2 Left (1)____ (2)____ Total:____

HOPPING: 2 Left and 1 Right (1)____ (2)____ Total:____

Scoring: for each trial subtract number of errors from 3.

MOVEMENT PATTERNS:

JUMPING: Standing Broad Jump (1)____ (2)____ (3)____ Total:____

Record jump in inches, to the nearest inch, as a motivational device.

While performing jump, record pattern elements present and deviations on the form below:

Pattern Elements Present	Deviations Noted
____ Arms swing back as legs bend	____ No arm swing, ____ back only, ____ up only
____ Arms swing up as legs extend	____ Jumps to side, ____ L, ____ R

___ Uses two-foot take off	___ Stumbles or falls on landing
___ Straight direction	___ Doesn't use arms to help
___ Brings arms down on landing	___ Uses one arm only, ___L, ___R
Comments:	___ Twists or bends to side, ___L, ___R

Scoring: Place a check (✓) in the blank for every applicable item: if the item is especially pronounced a plus (+) should be placed after the check; an ordinary deviation or pattern element would have a check (✓); a very good element or a very bad deviation a check plus (+) and a weak element or barely present deviation, a check minus (-).

OVERHAND THROWING:

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
___ Swinging, ___ Pushing throws	___ No swing L, ___R; no push ___L, ___R
___ Opposition arm & leg with swing	___ Uses only left side, ___Right side
___ Cross extension with push	___ Throws with both arms only
___ Able throw with L arm, ___R arm	___ Loses balance, ___almost
___ Uses whole body for distance	___ Jerky or uncontrolled movement
___ Controls object while throwing	___ Same side arm, leg forward
___ Similarity pattern each side	___ Gives force only with arm, ___body

Preferred hand ___L, ___R, ___No.

Scoring: see Movement Pattern scoring.

FORWARD ROLL

Trials:

(1)___ (2)___ (3)___ Total:___

Scoring: for each trial subtract errors from 5. No minus score is allowed.

KRAUS-WEBER ITEMS

Chest Raise

(1)___ Leg Raise (2)___ Total:___

Scoring: for each trial score one point for each second.

PERCEPTUAL-MOTOR MATCH: Chalkboard, double circles:
total 20 pts. minus 2 pts. for each error.

Errors:

- | | |
|--|---|
| ___ first attempts are small and far apart | ___ directions incorrect; opposite but wrong direction |
| ___ circles do not reach proper size | ___ circles flat toward inside |
| ___ one circle larger than the other | ___ inaccuracies which are not parallel in both circles |
| ___ one more accurate than the other | ___ visual attention directed to one hand |
| ___ circles drawn on top of the other | ___ movement of two arms not synchronized |
| ___ directions incorrect; hands parallel* | |

*Right handed child: direction of the drawings should be right hand counter-clockwise and, left hand clockwise. For the left handed child, these directions are reversed.

SCORING FORMS FOR PERCEPTUAL-MOTOR
AND MOTOR PERFORMANCE TESTS

Group C: Grades 3 and 4

Name: _____ Grade _____ School _____

Sex: _____ Date: _____

BALANCE:

Trials:

Walk Backwards (1)____ (2)____ (3)____ Total:____

Walk Sideways (1)____ (2)____ (3)____ Total:____
(preferred foot)

Scoring: for each trial subtract number of errors from 10.

RHYTHM AND COORDINATION:

HOPPING: Left and Right (1)____ (2)____ Total:____

HOPPING: 2 Right & 2 Left (1)____ (2)____ Total:____

HOPPING: 2 Left & 1 Right (1)____ (2)____ Total:____

Scoring: for each trial subtract number of errors from 3.

MOVEMENT PATTERNS:

JUMPING

Standing Broad Jump (1)____ (2)____ (3)____ Total:____

While subject is performing jump, record pattern elements present and deviations on the form below. Record jump, in inches, to the nearest inch.

Scoring: See Movement Pattern scoring.

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
<u>Arms swing back as legs bend</u>	<u>No arm swing</u> <u>back</u> only, <u>up</u> only
<u>Arms swing up as legs extend</u>	<u>Jumps to side,</u> <u>L,</u> <u>R</u>
<u>Uses two-foot take off</u>	<u>Stumbles or falls on landing</u>
<u>Straight direction</u>	<u>Doesn't use arms to help</u>
<u>Brings arms down on landing</u>	<u>Uses one arm only,</u> <u>L,</u> <u>R</u>
Comments: -	<u>Twists or bends to side,</u> <u>L,</u> <u>R</u>

Place a check (✓) in the blank for every applicable item: If the item is especially pronounced, a plus (+) should be placed after the check; an ordinary deviation or pattern element would have a check (✓); a very good element or a very bad deviation a check plus (+) and a weak element or barely present deviation, a check minus (-).

OVERHAND THROWING:

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
<u>Swinging,</u> <u>pushing</u> throws	<u>No swing L,</u> <u>R;</u> no push <u>L,</u> <u>R</u>
<u>Opposition arm & leg with swing</u>	<u>Uses only left side,</u> <u>right side</u>
<u>Cross extension with push</u>	<u>Throws with both arms only</u>
<u>Able throw with L arm,</u> <u>R arm</u>	<u>Loses balance,</u> <u>al-</u> <u>most</u>
<u>Uses whole body for distance</u>	<u>Jerky or uncontrolled movement</u>
<u>Controls object while throwing</u>	<u>Same side arm, leg forward</u>

PERCEPTUAL-MOTOR MATCH: Chalkboard, double circles:
total 20 pts. minus 2 pts. for each error.

Errors:

- | | |
|--|---|
| ___ first attempts are small and far apart | ___ directions incorrect; opposite but wrong direction |
| ___ circles do not reach proper size | ___ circles flat toward inside |
| ___ one circle larger than the other | ___ inaccuracies which are not parallel in both circles |
| ___ one more accurate than the other | ___ visual attention directed to one hand |
| ___ circles drawn on top of the other | ___ movement of two arms not synchronized |
| ___ directions incorrect; hands parallel* | |

*Right handed child: direction of the drawings should be right hand counter-clockwise and, left hand clockwise. For the left handed child, these directions are reversed.

DYNAMOMETER PRESS

	Trial	
Preferred Hand	(1)___	Total:___

SCORING FORMS FOR
PERCEPTUAL-MOTOR AND MOTOR PERFORMANCE TESTS

Group D: Grades 5 and 6

Name: _____ Grade _____ School _____

Sex: _____ Date: _____

BALANCE:

Trials:

Walk Backwards (1) _____ (2) _____ (3) _____ Total: _____

Walk Sideways (1) _____ (2) _____ (3) _____ Total: _____
(preferred foot)

Scoring: for each trial subtract number of errors from 10.

RHYTHM AND COORDINATION

HOPPING: 2 Right & 1 Left (1) _____ (2) _____ Total: _____

2 Left & 1 Right (1) _____ (2) _____ Total: _____

Scoring: for each trial subtract number of errors from 3.

MOVEMENT PATTERNS:

JUMPING:

Standing Broad Jump
Record in inches, to nearest inch. (1) _____ (2) _____ (3) _____ Total: _____

While subject is performing jump, record pattern elements present and deviations on the form below.

<u>Pattern Elements Present</u>	<u>Deviations Noted</u>
____ Arms swing back as legs bend	____ No arm swing, ____ back only, ____ up only
____ Arms swing up as legs extend	____ Jumps to side, ____ L, ____ R
____ Uses two-foot take off	____ Stumbles or falls on landing

Doesn't use arms to help

____ Uses one arm only:
L. R

Twists or bends to
side, L, R

Place a check (✓) in the blank for every applicable item: if the item is especially pronounced, a plus (+) should be placed after the check; an ordinary deviation or pattern element would have a check (✓); a very good element or a very bad deviation, a check plus (+) and a weak element or barely present deviation, a check minus (-).

TARGET THROW: 1.____ 2.____ 3.____ 4.____ 5.____
6.____ 7.____ 8.____ 9.____ 10.____ Total:____

Record number of hits.

OVERHAND THROWING:*

RHAND THROWING:"
 (Rate throwing while subject is doing the Target Throw
 test.)

Pattern Elements Present	Deviations Noted
___Swinging, ___pushing throws	___No swing L ___R; no push ___L, ___R
___Opposition arm & leg with swing	___Uses only left side, ___right side
___Cross extension with push	___Throws with both arms only
___Able throw with L arm, ___R arm	___Loses balance, ___al- most
___Uses whole body for distance	___Jerky or uncontrolled movement
___Controls object while throwing	___Same side arm, leg forward
___Similarity pattern each side	___Gives force only with arms, ___body

Preferred hand L, R, No.

*Scoring as indicated above in Movement Pattern scoring.